Switch Installation

This chapter contains the following sections:

Warnings

These warnings are translated into several languages in the Regulatory Compliance and Safety Information for the Cisco IE 4010 Switch document.

These warning statements apply to all the switches:

Warning Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. Statement 43

Warning Read the installation instructions before you connect the system to its power source. Statement 1004

Warning This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. Statement 1017

Warning This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024

Warning This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028

Warning Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030

Warning Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040

Warning For connections outside the building where the equipment is installed, the following ports must be connected through an approved network termination unit with integral circuit protection. 10/100/1000 Ethernet Statement 1044

Warning To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of :

140°F (60°C) Statement 1047

Note Operating temperatures exceeding 60C are not covered by the product safety certifications and approvals. However, the switch can function in the installations under the environmental conditions listed Switch Specifications.

Warning Installation of the equipment must comply with local and national electrical codes. Statement 1074

Note For U.S. installations, refer to national electrical code ANSI/NFPA 70.

Warning To prevent airflow restriction, allow clearance around the ventilation openings to be at least: 1.75 in. (4.4 cm). Statement 1076

Warning Avoid using or servicing any equipment that has outdoor connections during an electrical storm. There may be a risk of electric shock from lightning. Statement 1088

Installation Guidelines

Before installing the switch, verify that these guidelines are met:

- Cabling is away from sources of electrical noise, such as radios, power lines, and fluorescent lighting fixtures. Make sure that the cabling is away from other devices that might damage the cables.
- Operating environment is within the ranges listed in Technical Specifications.
- Relative humidity around the switch does not exceed 95 percent (non-condensing).
- Altitude at the installation site is not higher than 13,800 feet.
- For 10/100/1000 fixed ports, cable lengths from the switch to connected devices are not more than 328 feet (100 meters).
- For more information about SFP/SFP+ modules and cables, see Transceiver Modules.
- Airflow around the switch and through the vents is unrestricted. To prevent overheating, the switch must meet the minimum clearance of 1.75 inches (4.4 cm) at the top and bottom.

Note If the switch is installed in a closed or multirack assembly, the temperature around it might be greater than normal room temperature. Ensure that the internal temperature does not exceed the maximum ambient temperature specifications for the switch.

Verifying Switch Operation

Before installing the switch in a rack or on a wall, you should power the switch and verify that the switch passes the power-on self-test (POST).

To wire the switch to the power source, see Power-Supply Module Installation.

When the switch begins POST, the SYS LED blinks green, and the other LEDs stay green. When the switch passes POST, the SYS LED turns green. The other LEDs turn off and return to their operating status. If the switch fails POST, the SYS LED is amber

Note Contact Cisco Systems immediately if your switch fails POST.

After a successful POST, disconnect the power from the switch. For more information, see Wiring the Power Source. See Switch Installation, on page 1 to install the switch in a rack or on a wall.

Installing the Switch

The switch can be installed by:

- Rack-Mounting

- Wall-Mounting

Rack-Mounting

To rack-mount the switch, select the rack size and follow the steps in these sections:

Warning To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

This unit should be mounted at the bottom of the rack if it is the only unit in the rack.

When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.

If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack. Statement 1006

Warning For mounting railway-application equipment and for EN50155 standard compliance, the switch must be installed only in a rack mid-mounting position. If you install the switch in a front rack-mounting (cable side or power supply side) position or in a wall-mounting position, a mechanical failure can occur that results in the switch becoming detached from the rack. Statement 403

Attaching Brackets for 19-Inch Racks

The following illustrations show how to attach brackets to the switches.

Figure 1: Attaching Brackets for 19-Inch Racks (Front bracket)

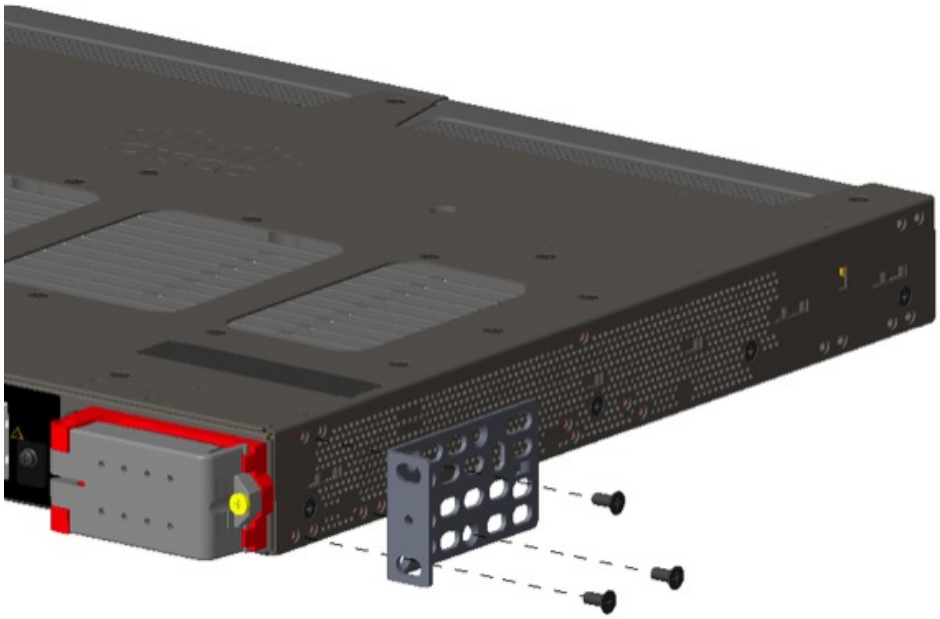
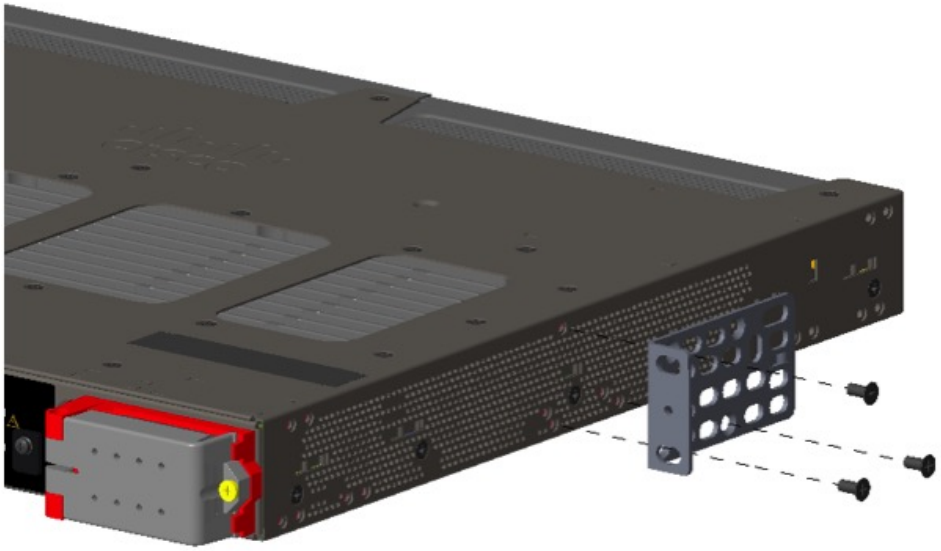


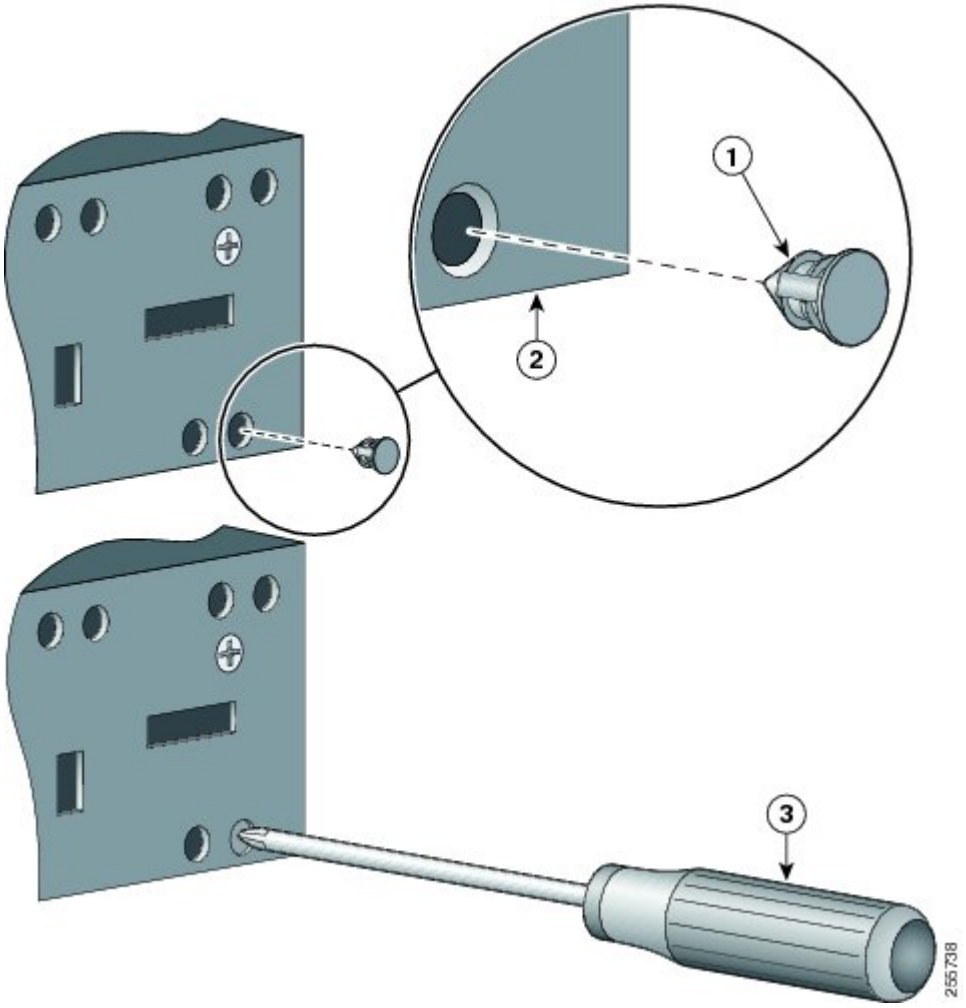
Figure 2: Attaching Brackets for 19-Inch Racks (Rear Mount)



Attaching Brackets for 19-Inch Racks for IP-30 Compliance (Optional)

Before installing the mounting brackets, you need to install the rubber plugs in the unused mounting holes. The following figure shows a close-up of the rubber plug. You can install the rubber plugs in the holes as shown in the next figure.

Figure 3: Inserting the Rubber Plug



1	Rubber plug
2	Switch
3	Screwdriver

1. Identify your bracket mounting position. See Attaching Brackets for 19-Inch Racks, on page 4.
2. Insert the rubber plugs in the appropriate holes on both sides of the switch.
3. Use a screwdriver or pen to completely push in the rubber plugs.
4. Install the brackets on both sides of the switch. See Attaching Brackets for 19-Inch Racks, on page 4.

Figure 4: Plug locations by position

Note For IP-30 compliance: If you use 23-inch brackets or ETSI brackets, you can insert the rubber plugs in the same holes as shown in the figure above before installing the brackets.

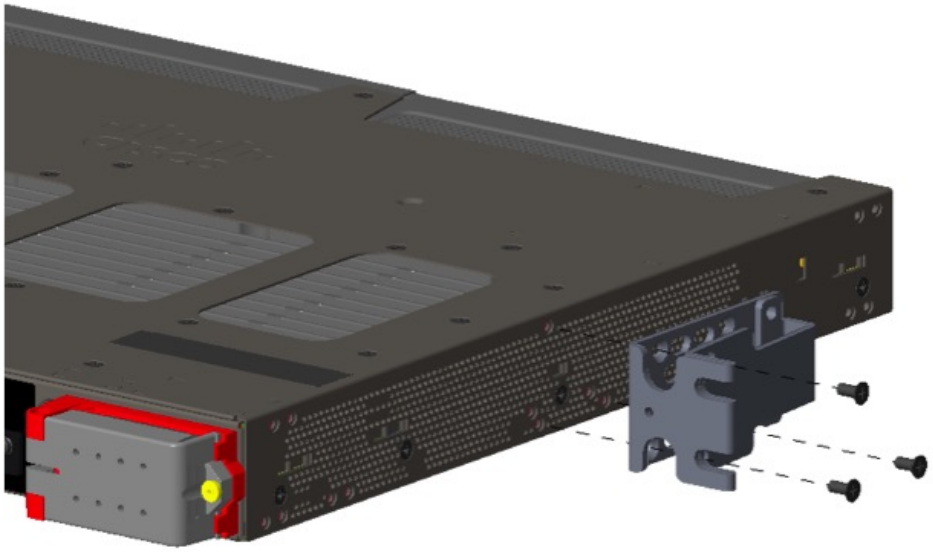
Attaching Brackets for 23-Inch Racks

If 23-inch brackets (RM-RGD-23IN=) are required, follow steps in the following figure for installation.

Note 23-inch and ETSI brackets should not be used in high vibration environments, including any railway application (EN50155).

Note For IP-30 compliance: If you use 23-inch brackets or ETSI brackets, you can insert the rubber plugs in the same holes as shown in Figure 11 ??? before installing the brackets.

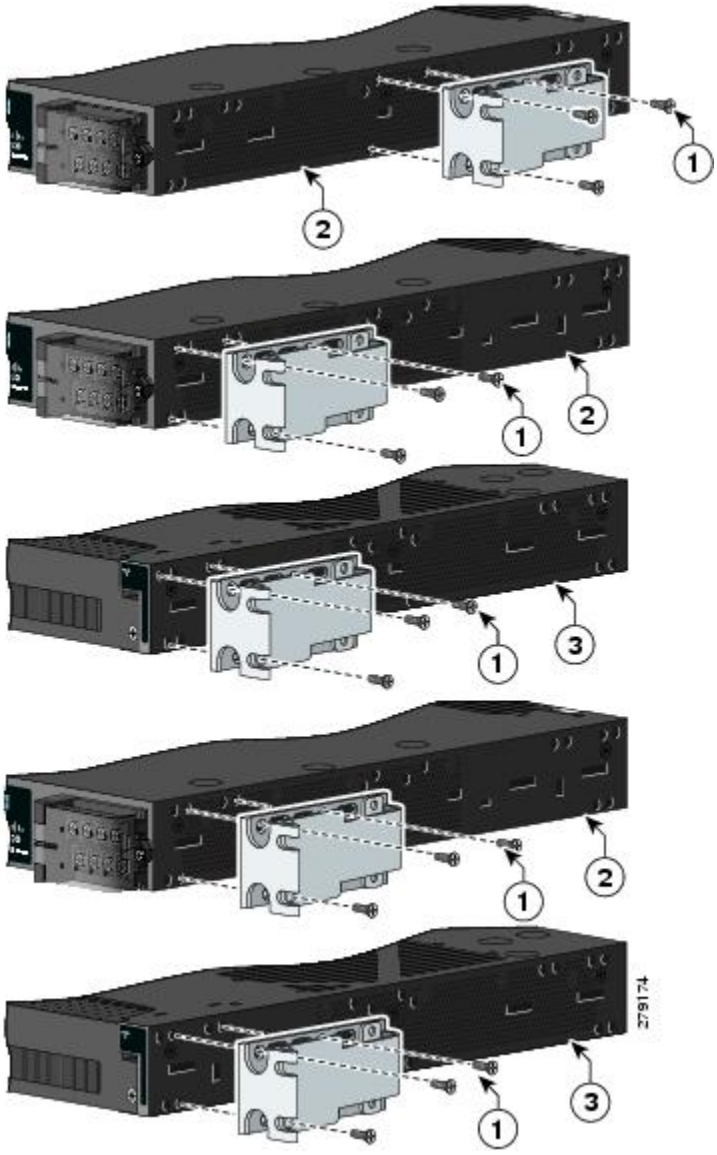
Figure 5: Attaching 23-Inch Brackets



Note For IP-30 compliance: If you use 23-inch brackets, you can insert the rubber plugs in the same holes as shown in Attaching Brackets for 19-Inch Racks, on page 4 before installing the brackets.

Attaching Brackets for ETSI Racks

Figure 6: Attaching Brackets (RM-RGD-ETSI=) for ETSI Racks



1	Phillips flat-head screws
2	Cable-side-mounting position
3	Power-supply-side mounting position

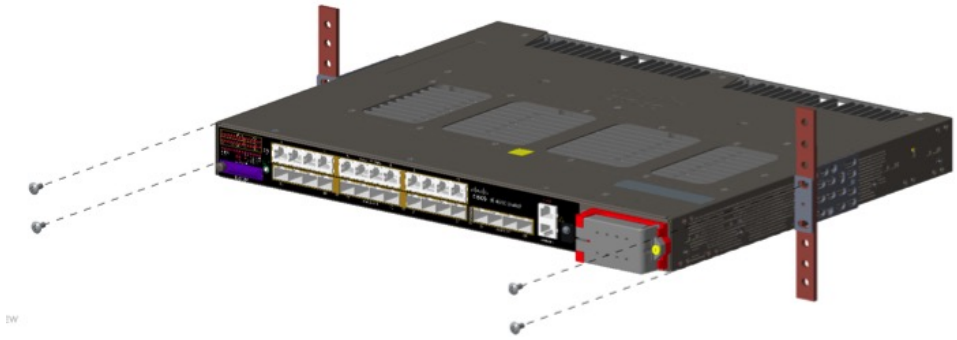
Note 23-inch and ETSI brackets should not be used in high vibration environments, including any railway application (EN50155).

Note For IP-30 compliance: If you use ETSI brackets, you can insert the rubber plugs in the same holes as shown in Figure 11 before installing the brackets.

Rack-Mounting the Switch

After you attach the brackets on the switch, attach the brackets to the rack.

Figure 7: Rack-Mounting



After the switch is mounted in the rack:

1. Wire the switch to a power source. See Wiring the Power Source.
2. Connect the ports. See Connecting Devices to the Ethernet Ports, on page 20.
3. Attach the cable guide to prevent the cables from obscuring the LED panels on the devices in the rack. Use the supplied black screw to attach the cable guide to the left or right bracket.

For configuration instructions about the CLI setup program, see Configuring the Switch with the CLI Setup Program.

Wall-Mounting

Warning Read the wall-mounting instructions carefully before beginning installation. Failure to use the correct hardware or to follow the correct procedures could result in a hazardous situation to people and damage to the system. Statement 378

Warning For mounting railway-application equipment and for EN50155 standard compliance, the switch must be installed only in a rack mid-mounting position. If you install the switch in a front rack-mounting (cable side or power supply side) position or in a wall-mounting position, a mechanical failure can occur that results in the switch becoming detached from the rack. Statement 403

If the switch is wall-mounted in an enclosure, follow these minimum clearances:

- Sides of switch (facing up and facing down): 3.75 in. (9.52 cm)
- Port side 3.0 in. (7.62 cm)

  Power supply side: 5.25 in. (13.33 cm)

  Cover side (not facing wall): 1.75 in. (4.44 cm)

  Base side (facing wall): 0 in. (0 cm)

To wall-mount the switch, follow the steps in these sections:

Attaching Brackets

Figure 8: Attaching 19-inch Rack Brackets

1	Phillips truss-head screws

Attaching Brackets for IP-30 Compliance (Optional)

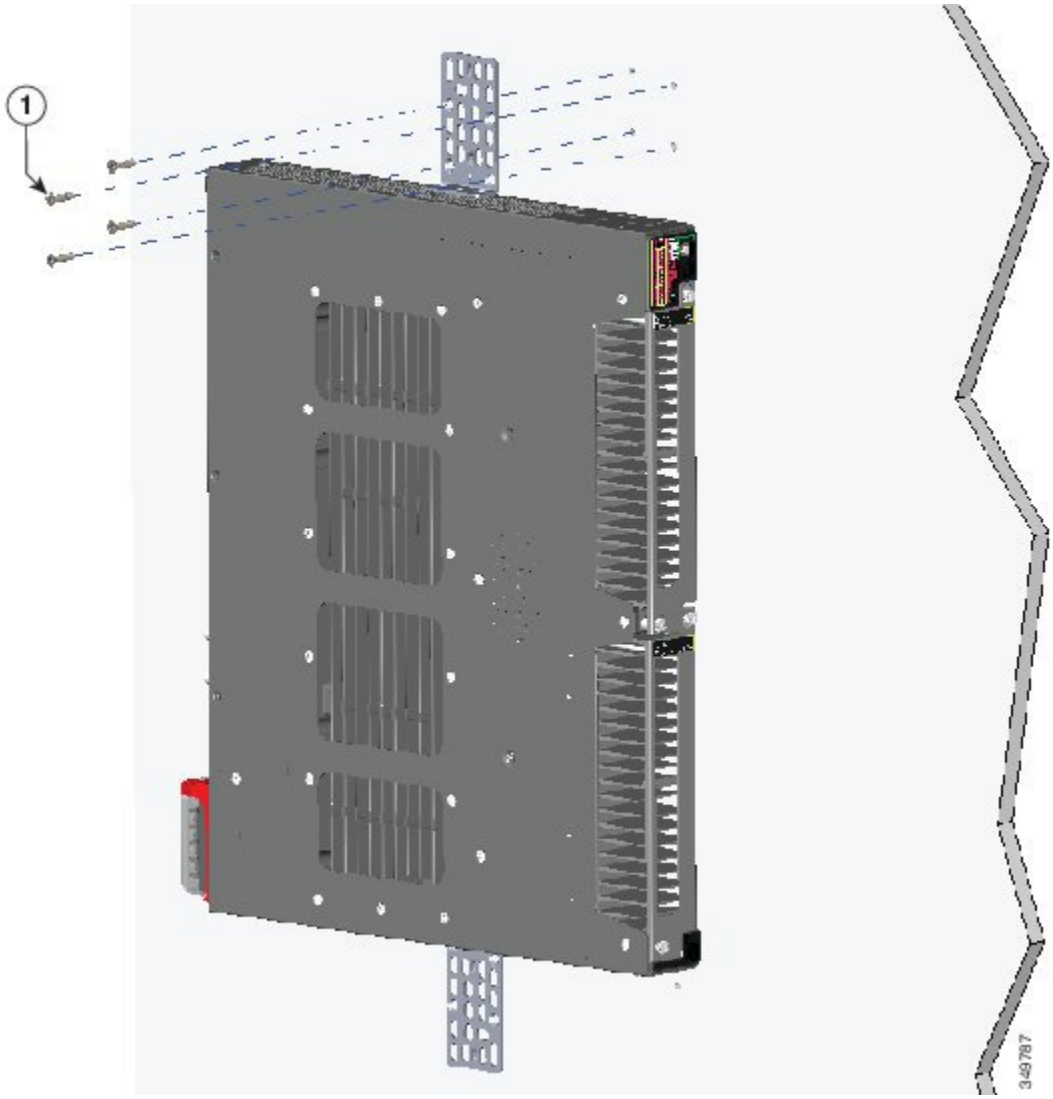
1. Insert the rubber plugs in the appropriate holes on both sides of the switch.
2. Use a screwdriver or pen to completely push in the rubber plugs.
3. Install the brackets on both sides of the switch.

Wall-Mounting the Switch

For the best support of the switch and cables, ensure that the switch is attached securely to wall studs or to a firmly attached plywood mounting backboard.

Orientation should exactly match the figure below, with power terminal down, the LEDs up, and the venting and Cisco Logo facing away from the wall. See the following figure.

Figure 9: Wall-Mounting



1	User-supplied screws

After the Switch is Mounted on the Wall

- Wire the switch to a power source. See Wiring the Power Source.
- For configuration instructions about using the CLI setup program, go to Configuring the Switch with the CLI Setup Program.
- Connect the switch ports. See Connecting Devices to the Ethernet Ports, on page 20.

Installing and Removing SFP Modules

This section presents procedures to install and remove fiber-optic and 1000BASE-T SFP transceiver modules.

Installing SFP Modules

These sections describe how to install and remove SFP modules. SFP modules are inserted into SFP module slots on the front of the switch. Field-replaceable SFP modules provide the uplink interfaces, send (TX) and receive (RX).

You can use any combination of rugged SFP modules. Each SFP module must be of the same type as the SFP module on the other end of the cable, and the cable must not exceed the stipulated cable length for reliable communications.

For more information about SFP modules, see Cisco Transceiver Modules.

Warning Do not insert and remove SFP modules while power is on; an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding. Statement 1087

Caution Depending on the SFP module you use, the operating temperature limits may be effected. Choose an SFP module appropriate to the installed environment.

Caution To prevent electrostatic-discharge (ESD) damage, follow standard board and component handling procedures.

Caution Do not install or remove the LC SFP module with fiber-optic cables attached because of potential damage to the cables, the cable connector, or the optical interfaces in the SFP module. Disconnect all cables before removing or installing an SFP module.

Note Removing and installing an SFP module can shorten its useful life. Do not remove and insert any module more often than is absolutely necessary.

Installing Fiber Optic SFP Modules

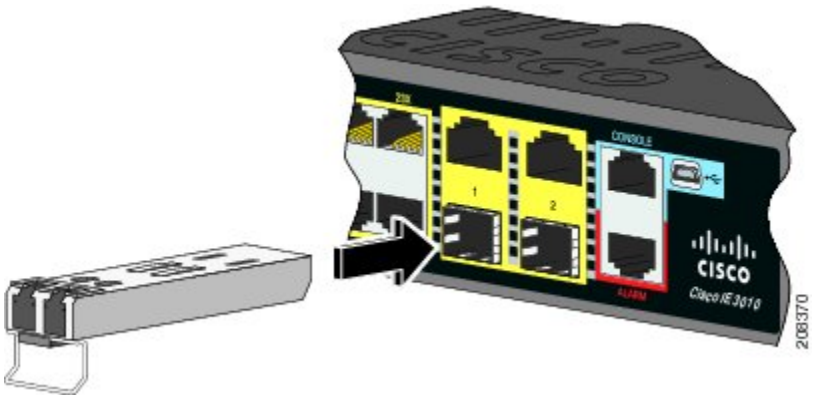
Warning Class 1 laser product. Statement 1008

To install and cable an optical SFP transceiver uplink port:

1. Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface.
2. Find the send (TX) and receive (RX) markings on the module top.

   On some SFP modules, the send and receive (TX and RX) markings might be replaced by arrows that show the direction of the connection, either send or receive (TX or RX).
3. If the module has a bale-clasp latch, move it to the open, unlocked position.
4. Align the module in front of the slot opening, and push until you feel the connector snap into place.
5. If the module has a bale-clasp latch, close it.
6. For fiber-optic SFP modules, remove the dust plugs and save.
7. Connect the SFP cables.

Figure 10: Installing an SFP Module



Caution Do not remove the dust plugs from the fiber-optic SFP module port or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the SFP module ports and cables from contamination and ambient light.

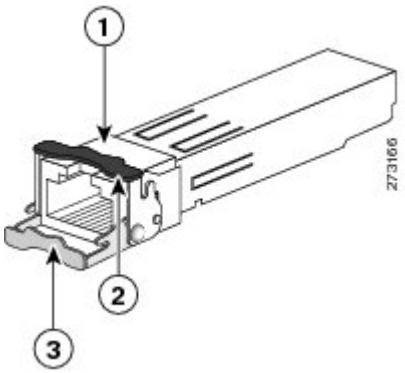
Installing 100/1000BASE-T SFP Modules

Table 1: 100/1000BASE-T SFP Modules

Model Number	Downlink Support	Uplink Support
GLC-T	10/100/1000	10/100/1000
GLC-TE	10/100/1000	10/100/1000

The 100/1000BASE-T (copper) SFP transceiver, seen in the following figure, has a bale-clasp locking mechanism that secures the transceiver in the module socket. The SFP network interface is an RJ-45 connector.

Figure 11: 1000BASE-T SFP Transceiver



1	RJ-45 connector
2	Bale-clasp latching mechanism in the closed (locked) position.
3	Bale-clasp latching mechanism in the open (unlocked) position.

Caution To comply with GR-1089 intrabuilding lightning immunity requirements, you must use grounded, shielded, twisted-pair, CAT5 cabling.

Note When connecting to a 100/1000BASE-T-compatible server, workstation, or router, use four twisted-pair, straight-through CAT5 cabling for the SFP transceiver port. When connecting to a 100/1000BASE-T-compatible switch or repeater, use four twisted-pair, crossover CAT5 cabling.

To install a 100/1000BASE-T SFP transceiver:

1. Attach an ESD-preventive wrist strap to your wrist and to the ESD ground connector on the chassis or to a properly grounded bare metal surface.

Caution To avoid ESD damage, handle the SFP by its sides; do not touch the connector pins.

2. Remove the SFP module from its protective packaging.
3. Check the markings on the SFP transceiver to verify that you have the correct model for your network.
4. Position the SFP transceiver in front of the port socket opening

Note Different Cisco devices have different SFP transceiver socket configurations. Your Cisco device might require that the SFP transceiver be installed with the bale-clasp either in a latch-up or a latch-down orientation. Verify that you have the SFP transceiver oriented correctly when you position it in front of the port socket.

5. With the bale-clasp closed (locked), slide the SFP transceiver into the socket until you feel it snap in place in the socket. You may hear an audible click as the SFP transceiver latch engages in the socket.
6. Connect the network interface cable RJ-45 plug to the SFP RJ-45 connector.
7. Observe the port status LED:
   - Green indicates that the SFP transceiver and the target device established a link.
   - Amber indicates that the port is discovering the network topology and searching for loops. This process takes about 30 seconds, and then the LED turns green.
   - Off indicates that the target device might not be turned on, there might be a cable problem, or there might be a problem with the adapter installed in the target device. Refer to Troubleshooting for solutions to cabling problems.

Connecting to SFP Modules

This section describes how to connect to a fiber-optic or 1000BASE-T SFP port. For instructions on how to install or remove an SFP module, see Connecting Devices to the Ethernet Ports, on page 20.

Warning Class 1 laser product. Statement 1008

Warning Do not connect or disconnect cables to the ports while power is applied to the switch or any device on the network because an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed from the switch and cannot be accidentally be turned on, or verify that the area is nonhazardous before proceeding. Statement 1070

Caution Do not remove the rubber plugs from the SFP module port or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the SFP module ports and cables from contamination and ambient light.

Caution To prevent ESD damage, follow standard board and component handling procedures.

Before connecting to the SFP module, be sure that you understand the port and cabling guidelines in Installing and Removing SFP Modules, on page 14. See Cable and Connectors for information about the LC on the SFP module.

Connecting to a Fiber Optic SFP Module

To connect a fiber-optic cable to an SFP module:

1. Remove the rubber plugs from the module port and fiber-optic cable, and store them for future use.
2. Insert one end of the fiber-optic cable into the SFP module port.
3. Insert the other cable end into a fiber-optic receptacle on a target device.
4. Observe the port status LED:
   - The LED turns green when the switch and the target device have an established link.
   - The LED turns amber while the STP discovers the network topology and searches for loops. This process takes about 30 seconds, and then the port LED turns green.
   - If the LED is off, the target device might not be turned on, there might be a cable problem, or there might be a problem with the adapter installed in the target device. See Troubleshooting for solutions to cabling problems
5. If necessary, reconfigure and restart the switch or the target device

Connecting to a 1000BASE-T SFP Module

Caution To prevent ESD damage, follow standard board and component handling procedures.

To connect a CAT5 cable to a 1000BASE-T SFP module:

1. When connecting to servers, workstations, and routers, insert a four twisted-pair, straight-through cable in the RJ-45 connector. When connecting to switches or repeaters, insert a four twisted-pair, crossover cable.

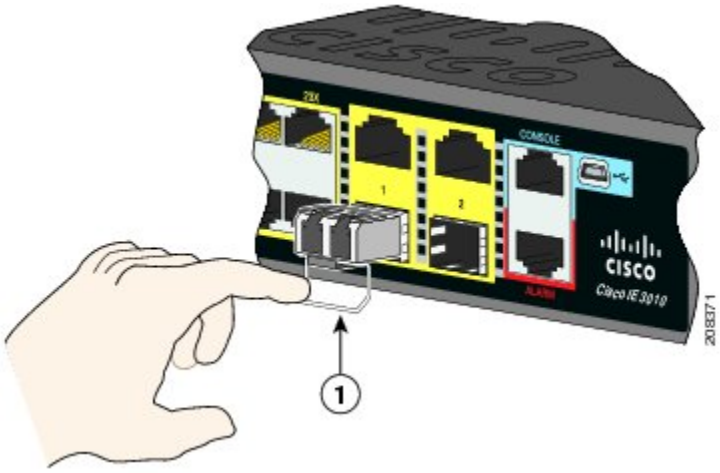
Note When connecting to a 1000BASE-T device, use a four twisted-pair CAT5 cable.

2. Insert the other cable end in an RJ-45 connector on a target device.
3. Observe the port status LED:
   - The LED turns green when the switch and the target device have an established link.
   - The LED turns amber while the STP discovers the network topology and searches for loops. This process takes about 30 seconds, and then the port LED turns green.
   - If the LED is off, the target device might not be turned on, there might be a cable problem, or there might be a problem with the adapter installed in the target device. See Troubleshooting for solutions to cabling problems.
4. If necessary, reconfigure and restart the switch or the target device.

Removing SFP Modules

1. Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface.
2. Disconnect the cable from the SFP module. For reattachment, note which cable connector plug is send (TX) and which is receive (RX).
3. Insert a dust plug into the optical ports of the SFP module.
4. If the module has a bale-clasp latch, pull the bale out and down to eject it. If the latch is obstructed and you cannot use your finger, use a small, flat-blade screwdriver or other long, narrow instrument.
5. Grasp the SFP module, and carefully remove it from the slot.
6. Place the module in an antistatic bag or other protective environment.

Figure 12: Removing a Bale-Clasp Latch SFP Module



1	Bale clasp

Replacing the SD Flash Memory Card

1. Locate the flash memory card slot on the cable-side of the switch.
2. Loosen the captive thumb screw. (Be careful not to cross-thread or over-tighten the thumb screw.)
3. Pull the cover open, and pull the cover tab from the hinge.
4. Gently push the flash memory card to eject it. Place it in an anti-static bag to protect it from static discharge.
5. Push the replacement card into the slot, and press it firmly in place. The card is keyed so that you cannot insert it the wrong way.
6. Place the flash card slot cover tabs into the hinge.
7. Close the cover, and hand-tighten the screw.

Connecting Devices to the Ethernet Ports

The Ethernet ports use standard RJ-45 connectors with Ethernet pinouts. The maximum cable length is 328 feet (100 meters). The 100BASE-TX and 1000BASE-T traffic requires Category 5, Category 5e, or Category 6 UTP cable. The 10BASE-T traffic uses Category 3 or Category 4 cable.

The autonegotiation feature is enabled by default on the switch. At this setting, the switch ports configure themselves to operate at the speed of the attached device. If the device does not support autonegotiation, you can set the switch port speed and duplex parameters. To maximize performance, either let the ports autonegotiate both speed and duplex, or set the port speed and duplex parameters on both ends of the connection.

For simplified cabling, the automatic medium-dependent interface crossover (auto-MDIX) feature is enabled by default. With auto-MDIX enabled, the switch detects the required cable type for copper Ethernet connections and configures the interface accordingly. Therefore, you can use either a crossover or a straight-through cable for connections to a Ethernet port, regardless of the type of connected device.

See the switch software configuration guide or the switch command reference on Cisco.com for more information about autonegotiation and auto-MDIX.

If auto-MDIX is disabled, use the guidelines in Cable and Connectors to select the cable for connecting the Ethernet ports to other devices.

When using PoE/PoE+, those ports have the same autonegotiation settings and cabling requirements as those in Connecting Devices to the Ethernet Ports, on page 20 . These ports provide PoE power.

See Cable and Connectors for information on the cables and connectors.

The ports provide PoE/PoE+ support for devices compliant with IEEE 802.3af/at and also provide Cisco prestandard PoE/PoE+ support for Cisco IP Phones and Cisco Aironet Access Points.

On a per-port basis, you can control whether or not a port automatically provides power to a connected IP phone or an access point.

To access an advanced PoE planning tool, use the Cisco Power Calculator on Cisco.com:

http://tools.cisco.com/cpc/launch.jsp

You can use this application to calculate the power supply requirements for a specific PoE/PoE+ configuration. The results show output current, output power, and heat dissipation.

Warning Voltages that present a shock hazard may exist on Power over Ethernet (PoE) circuits if interconnections are made using uninsulated exposed metal contacts, conductors, or terminals. Avoid using such interconnection methods, unless the exposed metal parts are located within a restricted access location and users and service people who are authorized within the restricted access location are made aware of the hazard. A restricted access area can be accessed only through the use of a special tool, lock and key or other means of security. Statement 1072

Caution Category 5e and Category 6 cables can store high levels of static electricity. Always ground the cables to a suitable and safe earth ground before connecting them to the switch or other devices.

Where to Go Next

You can use the default configuration or use any of the management options described in Management Options to change the switch settings.